

### REMARKS

This paper is filed in response to the Office Action mailed September 1, 2009.  
Claims 1 to 11 are pending and claims 1 to 8 and 10 are under consideration.

#### Regarding the Claim Amendments

The claim amendments are supported throughout the specification or were made to address various informalities. In particular, the amendment to claim 1 to recite that “the nucleic acid sequences encoding the  $\alpha$  subunit of the nitrile hydratase and the  $\beta$  subunit of the nitrile hydratase are each present separately on the first and second plasmids, respectively, and not on the same plasmid” is supported, for example, at page 5, lines 29-36; page 11, lines 31-37; and at page 16, lines 16-19. The amendment to claim 8 was made in order to be in proper dependent form. Thus, as the amendments are supported by the specification or were made to address informality, no new matter has been added and entry thereof is respectfully requested.

#### Regarding the Claim Objections

Claims 8 and 10 stand objected to due to be in improper dependent form. As set forth herein, claim 8 has been amended to be in proper dependent form. Claim 10, which depends from claims 1 to 8, is therefore no longer multiply dependent. Consequently, the objection to claims 8 and 10 is moot.

#### I. REJECTION UNDER 35 U.S.C. §102(b)

The rejection of claims 1 to 4, 6 and 7 under 35 U.S.C. §102(b) as allegedly anticipated by Nojiri *et al.* (*J. Biochem.* 125:696 (1999)) is respectfully traversed. Allegedly, Nojiri *et al.* describe each and every element claimed, as set forth on page 3 of the Office Action.

Claims 1 to 4, 6 and 7 are not anticipated under 35 U.S.C. §102. Nevertheless, solely in order to further prosecution of the application and without acquiescing to the propriety of the rejection, the claims have been amended as set forth above. The rejection will therefore be addressed with respect to the amended claims.

Nojiri *et al.*, at best, describe a plasmid system in which are expressed on the same plasmid (see, for example, page 700, second column, third paragraph). In particular, the

nucleic acid sequences encoding  $\alpha$  subunit of the nitrile hydratase and  $\beta$  subunit of the nitrile hydratase were present on the same plasmid, and not on different plasmids. In contrast to Nojiri *et al.*, the amended claims recite that the nucleic acid sequences encoding the  $\alpha$  subunit of the nitrile hydratase and the  $\beta$  subunit of the nitrile hydratase are each present separately on the first and second plasmids, and not on the same plasmid. Accordingly, Nojiri *et al.* fail to describe the expression system of claims 1 to 4, 6 and 7.

In sum, Nojiri *et al.* fail to describe an expression system in which the nucleic acid sequences encoding the  $\alpha$  subunit of the nitrile hydratase and the  $\beta$  subunit of the nitrile hydratase are each present separately on the first and second plasmids, and not on the same plasmid. Consequently, claims 1 to 4, 6 and 7 are not anticipated by Nojiri *et al.* (*J. Biochem.* 125:696 (1999)) under 35 U.S.C. §102(b) and the rejection must be withdrawn

## II. REJECTION UNDER 35 U.S.C. §103(a)

The rejection of claim 5 under 35 U.S.C. §103(a) as allegedly obvious over Nojiri *et al.* (*J. Biochem.* 125:696 (1999)) in view of Nishiyama *et al.* (*J. Bacteriol.* 173:2465 (1991)) is respectfully traversed. Allegedly, Nojiri *et al.* in combination with Nishiyama *et al.* teach or suggest each and every element claimed, as set forth on pages 4-5 of the Office Action.

Claim 5 prior to entry of this paper would not have been obvious in view of Nojiri *et al.* alone, or in combination with Nishiyama *et al.* Nevertheless, solely in order to further prosecution of the application and without acquiescing to the propriety of the rejection, claim 1 has been amended. The rejection will therefore be addressed with respect to amended claim 1, from which claim 5 depends.

As discussed above, Nojiri *et al.* fail to describe an expression system in which the nucleic acid sequences encoding the  $\alpha$  subunit of the nitrile hydratase and the  $\beta$  subunit of the nitrile hydratase are each present separately on the first and second plasmids, and not on the same plasmid. Furthermore, there is no suggestion whatsoever in Nojiri *et al.* to produce an expression system in which the nucleic acid sequences encoding the  $\alpha$  subunit of the nitrile hydratase and the  $\beta$  subunit of the nitrile hydratase are each present separately on the first and second plasmids, and not on the same plasmid. In this regard, Nojiri *et al.* state that in a system in which the  $\alpha$  subunit of the nitrile hydratase and the  $\beta$  subunit of the nitrile hydratase are on the same plasmid that “the amounts of the  $\alpha$  and  $\beta$  subunit expressed were

not equal...expression of the  $\beta$  subunit was fairly low compared with that of the  $\alpha$  subunit.” (page 701, first column, second paragraph) In order to increase expression of the  $\beta$  subunit, Nojiri *et al.* add a second plasmid expressing a  $\beta$  subunit (pHSG $\beta$ ) to the plasmid expressing both the  $\alpha$  and  $\beta$  subunits. (page 701, first column, third paragraph) Thus, Nojiri *et al.* fail to teach or suggest modifying this system such that the nucleic acids encoding the  $\alpha$  subunit of the nitrile hydratase and the  $\beta$  subunit of the nitrile hydratase are each present separately on the first and second plasmids, and not on the same plasmid.

Moreover, Nojiri *et al.* fail to provide any motivation to produce the claimed expression system, as the authors state that “We have succeeded in producing a large amount of a functional NHase in *E. coli* by optimizing the cultivation conditions and co-expressing the NHase activator encoded downstream of the  $\beta$  subunit gene.” (page 697, first column, third paragraph) In view of the fact that Nojiri *et al.* teach that the system they developed produced a large amount of functional NHase, there is no motivation to modify the expression system of Nojiri *et al.* at all, let alone a motivation to develop an expression system in which the nucleic acid sequences encoding the  $\alpha$  subunit of the nitrile hydratase and the  $\beta$  subunit of the nitrile hydratase are each present separately on the first and second plasmids, and not on the same plasmid. Consequently, one of skill in the art would not have had any motivation to develop an expression system in which the nucleic acid sequences encoding the  $\alpha$  subunit of the nitrile hydratase and the  $\beta$  subunit of the nitrile hydratase are each present separately on the first and second plasmids, and not on the same plasmid.

Nishiyama *et al.* (J. Bacteriol. 173:2465 (1991)) fail to provide that which is missing from Nojiri *et al.* Namely, Nishiyama *et al.* fail to teach or suggest, or provide any motivation to develop an expression system in which the nucleic acid sequences encoding the  $\alpha$  subunit of the nitrile hydratase and the  $\beta$  subunit of the nitrile hydratase are each present separately on the first and second plasmids, and not on the same plasmid. Consequently, at the time of the invention one of skill in the art, in view of Nojiri *et al.* alone, or in combination with Nishiyama *et al.*, would not have had a motivation to develop an expression system different from Nojiri *et al.*, let alone a system in which the nucleic acid sequences encoding the  $\alpha$  subunit of the nitrile hydratase and the  $\beta$  subunit of the nitrile hydratase are each present separately on the first and second plasmids, and not on the same plasmid.

In sum, Nojiri *et al.* and Nishiyama *et al.* alone, or in combination, fail to teach or suggest, or would have motivated one of skill in the art at the time of the invention to develop an expression system in which the nucleic acid sequences encoding the  $\alpha$  subunit of the nitrile hydratase and the  $\beta$  subunit of the nitrile hydratase are each present separately on the first and second plasmids, and not on the same plasmid. Consequently, claim 5 would not have been obvious in view of Nojiri *et al.* (J. Biochem. 125:696 (1999)) and Nishiyama *et al.* (J. Bacteriol. 173:2465 (1991)) under 35 U.S.C. §103(a) and the rejection must be withdrawn.


**CONCLUSION**

In summary, for the reasons set forth herein, Applicants maintain that the claims clearly and patentably define the invention, respectfully request that the Examiner reconsider the various grounds set forth in the Office Action, and respectfully request the allowance of the claims which are now pending.

If the Examiner would like to discuss any of the issues raised in the Office Action, Applicant's representative can be reached at (858) 509-4065. Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,

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